

★IZUMI/

Q45

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Hand rail assembly for stairs of building - has auxiliary connection part which connects main connection part with hemispheres and fixing members

IZUMI S 94.10.25 94JP-284204

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The assembly has a pair of hemispheres (5,15) of hollow state provided with a pair of connection holes (5a,15a). A pair of guide surfaces (5e,15e) are formed at the axis of the hemispheres.

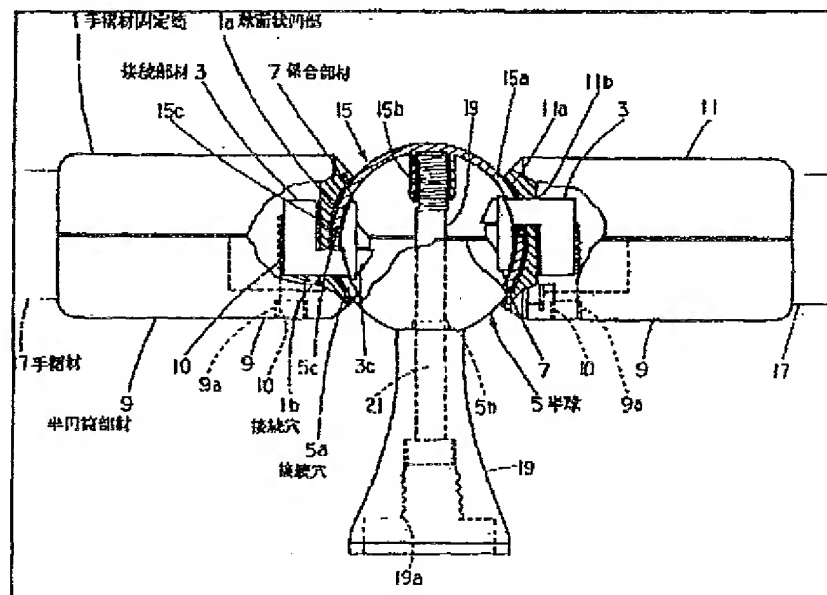
A pair of fixing members (1,11) of cylindrical state are provided with a pair of fixing holes (1b,11b) at an end face.

A hand rail material (17) is fixed to the fixing members. An auxiliary connection part (3) connects a main connection part (7) with the hemispheres and the fixing members.

ADVANTAGE - Enables adjustment of angles. Avoids special tools and skilled worker. Offers easy design and processing. Offers easy transportation. (7pp

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### 技術表示箇所

審査請求 未請求 請求項の数 3 FD (全 7 頁)



## 【特許請求の範囲】

【請求項1】 互いに開口部が合わせられて球体を形成し側面に接続穴が形成された中空状の一对の半球と、この半球を互いに合わせて球体を形成し前記半球が互いに対面した状態で同軸的に回動可能なガイド面と、前記半球の球面の一部とほぼ同一の球面状凹部を端面に有しこの球面状凹部に接続穴を有した一对の手摺材固定筒と、この手摺材固定筒に固定される手摺材を有し、前記手摺材固定筒の球面状凹部に設けられた接続穴と前記半球に形成された接続穴とを各々対面させ、各接続穴内を移動可能な太さの部分

【0004】この発明は、前記従来の技術の問題点に鑑みてなされたもので、いかなる屈曲状態に対しても、取り付け現場で簡単に屈曲角度を調整可能な手摺を提供することを目的とする。

## 【0005】

【課題を解決するための手段】この発明は、互いに開口部が合わせられて球体を形成し側面に接続穴が形成された中空状の一对の半球と、この半球を互いに合わせて球体を形成し前記半球が互いに対面した状態で同軸的に回動可能なガイド面と、前記半球の球面の一部とほぼ同一の球面状凹部を端面に有しこの球面状凹部に接続穴を有した一对の手摺材固定筒と、この手摺材固定筒に固定される手摺材を有し、前記手摺材固定筒の球面状凹部に設けられた接続穴と前記半球に形成された接続穴とを各々対面させ、各接続穴内を移動可能な太さの部分

【請求項2】 前記半球に設けられた接続穴は、前記接続部材の挿入片が前記半球のガイド面に対して直交する方向に長く長方形に形成され、その短辺の幅は、前記挿入片の幅とほぼ等しいものである請求項1の手摺。

【請求項3】 前記接続部材は、前記手摺材固定筒内に係合する係止部を有し、前記接続部材の挿入片には、この挿入片を前記半球内に係止する係合部材が係合する段部を有する請求項1または2記載の手摺。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】この発明は、階段等に設けられる手摺であって、特に屈折部分に用いられる手摺に関する。

## 【0002】

【従来の技術】従来、例えば階段が途中で折れ曲がった形状の場合、その階段の側面に手摺を取り付ける際、手摺もその階段に沿って取り付ける必要があるため、複数の直線状の手摺をそれぞれ独立させて取り付けるか、或いは、図16に示すように、階段の屈曲角度に合わせた中間連結部材23を介してその両側に直線状の手摺材25を取り付けていた。

## 【0003】

【発明が解決しようとする課題】前記従来の技術の前者の場合、固定箇所が増え、手摺の部品数も増加し取り付け工数が増加してしまうものであった。また、前記従来の技術の後者の場合、図16に示すように、中間連結部材23を用いてその両側に二本の手摺材25を接続するには、その階段の角度等に応じて、手摺材25の接続角度が変わるため、その階段毎に取り付け角度に応じた中間部材23を用意せねばならなかった。従って、手摺の製作コストがかかり、部品点数も増加し、取付コストが高くなるものであった。

## 【0006】

【作用】この発明の手摺は、前記一对の手摺材固定筒が各々取り付けられた半球に対して、相対的に揺動可能に設けられ、さらにこの回動方向と直交する方向に、前記球状部が球体を維持したまま各半球が手摺材固定筒とともに回動することができるものである。

## 【0007】

【実施例】以下、この発明の一実施例を図面に基づいて説明する。この実施例の手摺は、図1に示すように、中空状の一对の半球5、15を有し、この半球5、15の開口部周縁部には、互いに合わせた状態で互いに同軸的に回転揺動するガイド面5c、15cが形成されている。さらに、半球5、15の球面の一部とほぼ同一の球面状凹部1a、11aを端面に有した一对の手摺材固定筒1、11が設けられ、この手摺材固定筒1、11に、各々手摺材17が固定されて、手摺が形成されるものである。

【0008】半球5、15のガイド面15cは、内周面全周が直角状に切り欠かれた形状を有し、ガイド面5cはこのガイド面15cに係合する突縁部からなるものである。さらに、半球5、15には、図1、図4、図5に示すように、各々側方からガイド面5c、15c近傍に向かって伸びた長方形の接続穴5a、15aが形成されている。また、半球15の内周面頂部には、雄ネジ孔15bが形成され、半球5の頂部には、透孔5bが形成されている。

【0009】手摺材固定筒1、11は、図2、図3に示すように、側面半周分が切除された形状で、その一端

である球面状凹部1 a, 1 1 aの内側に、後述する接続部材3の取付凹部1 e, 1 1 eが形成されている。この取付凹部1 e, 1 1 eの底部には、雌ネジ部1 c, 1 1 cが形成されている。さらに、手摺材固定筒1, 1 1の球面状凹部1 a, 1 1 aには、図1～図3に示すように、半球5, 1 5の接続穴5 a, 1 5 aより小さい接続穴1 b, 1 1 bが各々形成されている。接続穴1 bは、図2に示すように、手摺材固定筒1の切除されていない側面側に近い位置に形成され、接続穴1 1 bは、図3に示すように、手摺材固定筒1 1の切除された側面部に近い位置に形成されている。

【0010】半球5, 1 5の接続穴5 a, 1 5 aと、手摺材固定筒1, 1 1の接続穴1 b, 1 1 bには、各々図6に示すL字状の接続部材3が挿入される。接続部材3には、図1、図6に示すように、接続穴1 b, 5 aに挿入するための挿入片3 cを備え、その挿入片3 cの一端部から直角に起立し、手摺材固定筒1, 1 1の取付凹部1 e, 1 1 eに嵌合し係止される係止部3 dが形成されている。また、この係止部3 dには、取付凹部1 e, 1 1 eに形成された雌ネジ部1 c, 1 1 cを通じてボルト1 0が通るためにボルト溝3 bが形成されている。

【0011】さらに、挿入片3 cには、図7に示す係合部材7の係止片7 cが挿通され係合する段部である溝3 aが、その両側に形成されている。この係合部材7は、コ字状に形成され、一対の係止片7 cを有し、この係止片7 cを接続部材3の溝3 aに通した状態で、挿入片3 cの先端部と接触する凸部7 dが形成されている。また、この係合部材7の外郭部7 bもまた、半球5の内周面の球面とほぼ同一の球面となっている。

【0012】手摺材固定筒1, 1 1の側面の切除部には、この切除部分を覆い、手摺材固定筒1, 1 1を円筒状に形成する半円筒部材9が取り付けられる。半円筒部材9は図1, 図13に示すように、固定用のボルト1 0が挿通するボルト穴9 aを有し、このボルト1 0が、手摺材固定筒1, 1 1の雌ネジ部1 c, 1 1 cに螺合してこの半円筒部材9と手摺材固定筒1, 1 1とを固定する。

【0013】半球5, 1 5には、図1等に示すように、組立状態で、支柱連結部材1 9がボルト2 1により固定される。ボルト2 1は、半球5の透孔5 bに挿通され、半球1 5の雌ネジ部1 5 bに螺合して、これらを確実に固定する。さらに、支柱連結部材1 9には、雌ネジ部1 9 aが形成され、図15に示すように、支柱2 0に図示しないボルトにより固定可能に形成されている。

【0014】ここで、それぞれの部材は、例えば鋳物により形成されるが、それほど高い強度を必要としない部分については、プラスチック等の合成樹脂を射出成形によって形成してもよく、これらの部材の材質は適宜選択可能なものである。

【0015】次に、この実施例の手摺の組み立て方法を

説明する。まず、図8、図9に示すように、接続部材3の挿入片3 cを手摺材固定筒1の接続穴1 bに通し、接続部材3の係止片3 dを取付凹部1 eに嵌合する。これにより、図9に示すように挿入片3 cは、手摺材固定筒1の球面状凹部1 aの接続穴1 bより突出した状態となる。

【0016】そして、図10に示すように、図面上で、半球5のガイド面5 cが上に位置するようにして、半球5の接続穴5 aに挿入片3 cを通す。この後、図11に示すように、この半球5より突出した挿入片3 cの溝3 aに、係合部材7の係止片7 cを通すようにして掛ける。この時、係合部材7の球面状の外郭7 bは、半球5の内球面に沿って対面している。

【0017】また、他の接続部材3の挿入片3 cを、図12に示すように、もう一方の手摺材固定筒1 1の接続穴1 1 bに通し、半球1 5のガイド面1 5 cが下に位置するようにして、半球1 5の接続穴1 5 aに挿入片3 cを通す。この後、前記と同様に、この半球1 5より突出した挿入片3 cの溝3 aに、係合部材7の係止片7 cを通すようにして掛ける。ここで、図3及び図12に示すように、手摺材固定筒1, 1 1の接続穴1 b, 1 1 bの位置は、球面状凹部1 a, 1 1 aの各中心点に対して対称位置にある。従って、上述のように、接続部材3は、手摺材固定筒1, 1 1の各々で取りつける向きが逆となり、半球5, 1 5の向きも逆となる。

【0018】そして、図1に示すように、半球5の下部のボルト穴5 bの位置に支柱取付部材1 9を合わせ、ボルト2 1を通し、その先端が半球1 5の雌ネジ部1 5 bに螺合し、支柱1 9と二つの半球5および1 5は完全に固定される。さらに、図13に示すように、手摺材固定筒1, 1 1の内において、接続部材3と手摺材固定筒1, 1 1の取付凹部1 e, 1 1 eに形成される間隙には、ばね材4が取り付けられている。これにより、半球5, 1 5と手摺材固定筒1, 1 1とを互いに引きつけ合い、確実に連結状態が維持されるように形成されている。次に、二つの手摺材固定筒1, 1 1に、各々半円筒部材1 1を合わせ、半円筒部材1 1のボルト穴1 1 aからボルト1 0を通し固定することで、この実施例の手摺が完成する。

【0019】次のこの手摺の使用例について説明する。この手摺は、例えば、手摺が必要な階段等の形状に沿って、所定の高さに取り付けられるが、踊り場等が設けられている長い階段では、踊り場手前に形成される階段の屈曲部で、手摺も屈曲させなければならないので、この部分に半球5, 1 5による球が位置するように取り付ける。取り付けの際には、階段の屈曲した角度に合わせて、半球5, 1 5による球状部の両側の手摺材固定筒1, 1 1を相対的に回動させて、両側の手摺材固定筒1, 1 1を所望の角度に調節する。これに、図15に示すように、各手摺材固定筒1, 1 1に手摺材1 7を取り付け、手摺

を完成させる。

【0020】この実施例の手摺によれば、階段の屈曲部に合わせて手摺材固定筒の接続部を、施工現場で容易に任意の角度に設定することができ、個別の部品を必要とせず、部品点数及び施工工数の削減が可能となり、コストダウンも可能となる。

【0021】なお、この実施例では、形状の違う手摺材固定筒を用いたが、両者の形状は同じでもよく、その場合は、部品点数をさらに減らすことが可能となる。これらの形状は適宜設定可能である。

【0022】

【発明の効果】この手摺は、軸方向に角度変化が可能なので、複雑な形状の階段に対しても施工現場で簡単に手摺の接続部分の角度を、適切に設定することができる。そのため、多種の中間材を予め用意しておく必要がないものである。また、接続部材は、どの角度においても、常に球に被われているため、見た目にも美しく、使用者の手に引っ掛かるものがなく良好な使用感を得ることができるものである。また、工程が単純になること、特殊な工具や熟練者を必要とせず、設計、加工、施工の簡易化を図ることができ、また、完全組み立て式なので、

【図面の簡単な説明】

【図1】この発明の一実施例の手摺の部分破断正面図である。

【図2】この実施例の手摺材固定筒を示す平面図(A)、正面図(B)、右側面図(C)、左側面図(D)である。

【図3】この実施例の他の手摺材固定筒を示す平面図(A)、正面図(B)、右側面図(C)、左側面図(D)である。

【図4】この実施例の構成部品の半球を示す平面図(A)、部分破断正面図(B)、右側面図(C)である。

【図5】この実施例の構成部品の他の半球を示す平面図(A)、正面図(B)、右側面図(C)である。

【図6】この実施例の接続部材を示す平面図(A)、正面図(B)、右側面図(C)である。

【図7】この実施例の係合部材を示す平面図(A)、正面図(B)、右側面図(C)である。

【図8】この実施例の手摺材固定筒の組み立て図である。

【図9】この実施例の手摺材固定筒の組み立て図である。

【図10】この実施例の手摺材固定筒の組み立て図である。

【図11】この実施例の手摺材固定筒の組み立て図である。

【図12】この実施例の他の手摺材固定筒の組み立て図である。

【図13】この実施例の手摺を下方から見た斜視図である。

【図14】この実施例の手摺を上方から見た斜視図である。

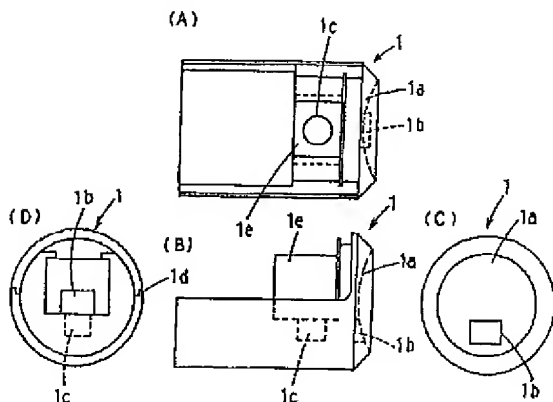
【図15】この実施例の手摺の使用例を示す斜視図である。

【図16】従来の手摺である。

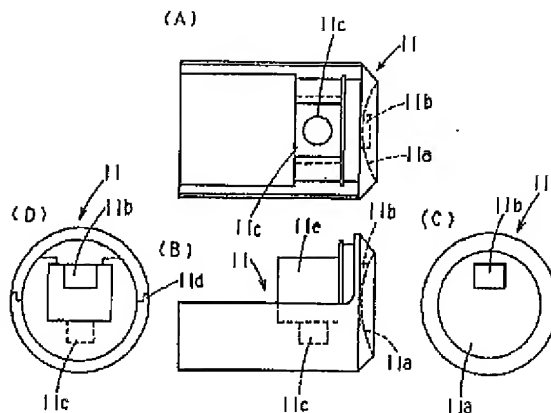
【符号の説明】

- |         |        |
|---------|--------|
| 1, 11   | 手摺材固定筒 |
| 1a, 11a | 球面状凹部  |
| 1b, 11b | 接続穴    |
| 3       | 接続部材   |
| 5, 15   | 半球     |
| 5a, 15a | 接続穴    |
| 7       | 係合部材   |
| 9       | 半円筒部材  |
| 17      | 手摺材    |

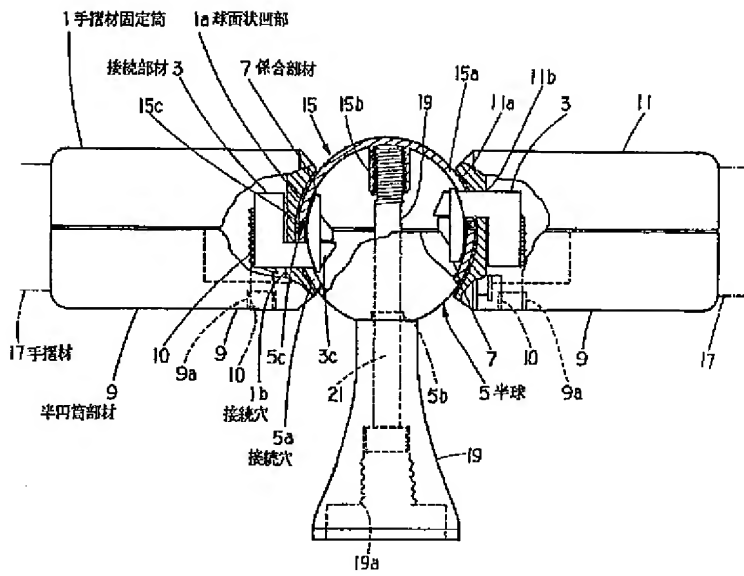
【図2】



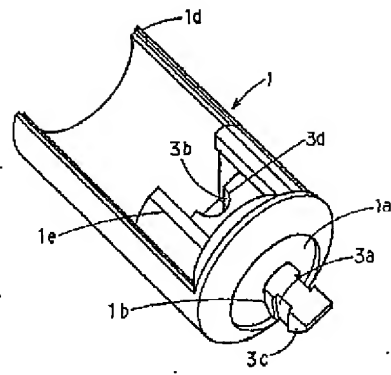
【図3】



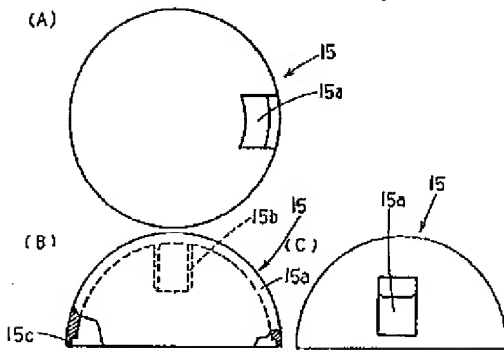
【図1】



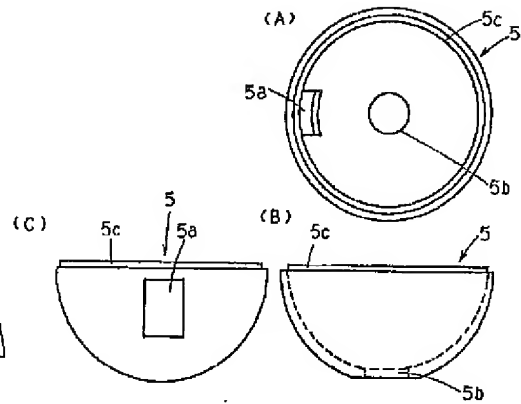
【図9】



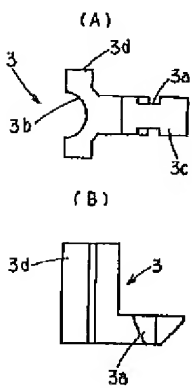
【図4】



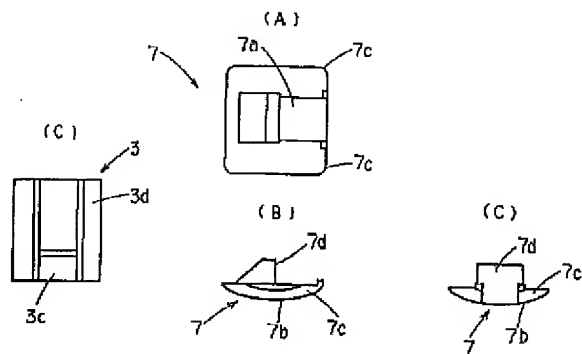
【図5】



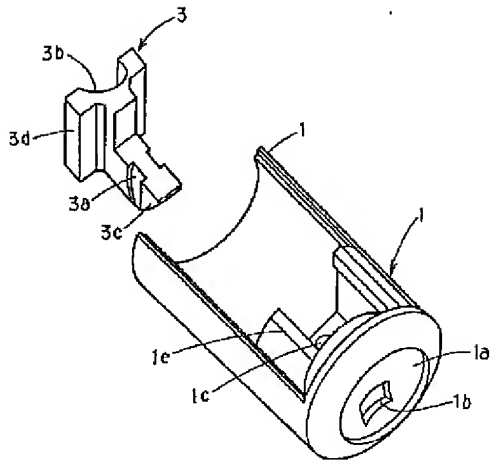
【図6】



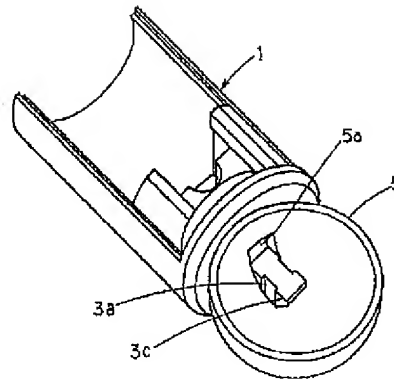
【図7】



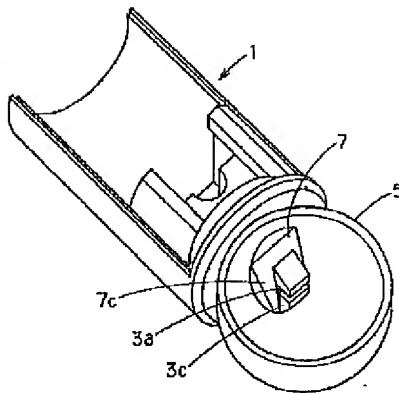
【図8】



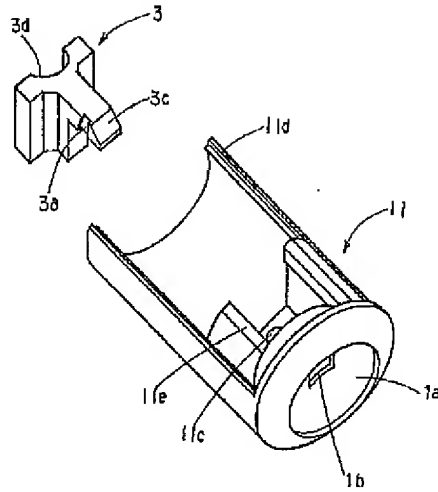
【図10】



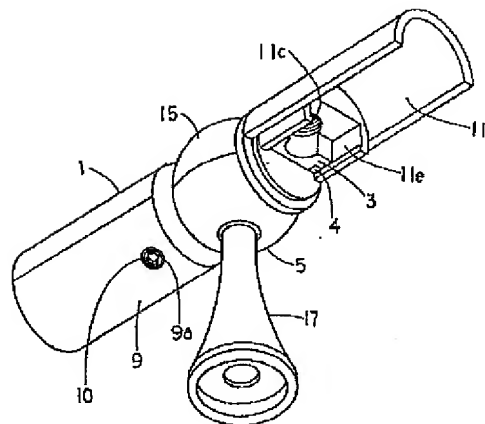
【図11】



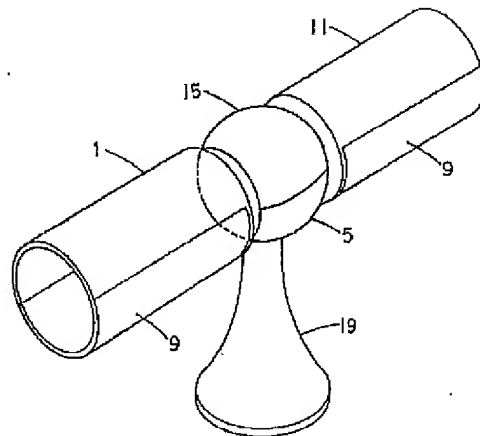
【図12】



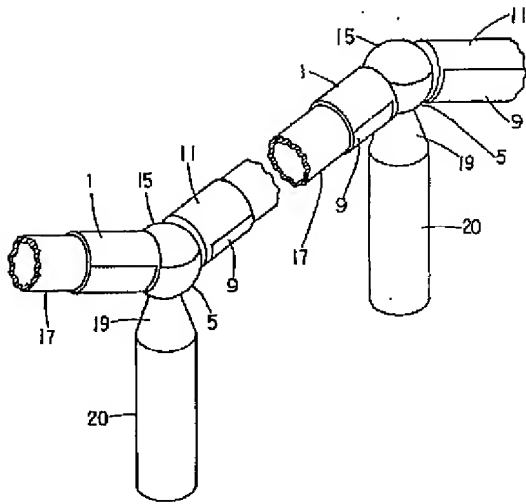
【図13】



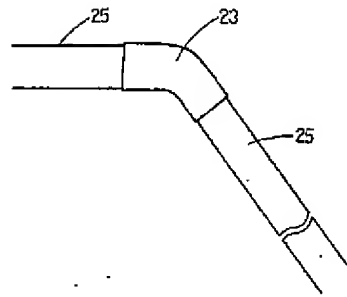
【図14】



【図15】



【図16】





## PATENT ABSTRACTS OF JAPAN

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(72)Inventor : IZUMI SHUHEI

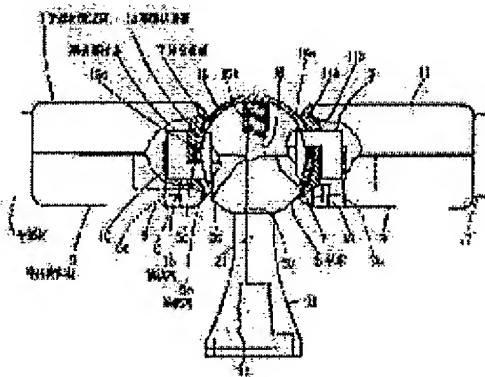
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(54) HANDRAIL

(57)Abstract:

PURPOSE: To make it possible to adjust a bending angle easily in a mounting site for any bending state of a handrail.

CONSTITUTION: A pair of hollow hemispheres 5 and 15 forming joint holes 5a and 15a in the sides of a sphere formed by joining opening sections with each other and guide faces 5c and 15c capable of rotating coaxially in a state to face the hemispheres 5 and 15 with each other are provided. The approximately same spherical recesses 1a and 11a as parts of a spherical surface of the hemispheres 5 and 15 are provided to the end faces and pair of handrail material fixing pipes 1 and 11 forming joint holes 1b and 11b in the spherical recesses 1a and 11a and handrail materials 17 fixed to the handrail material fixing pipes 1 and 11 are provided. The joint holes 1b and 11b and the joint holes 5a and 15a of the hemispheres 5 and 15 are respectively faced with each other, a joint member 3 having thick parts capable of moving inside the joint holes is made to pass through the joint holes, and interlocking members 7 interlocking both ends of to the joint member 3 with the hemispheres 5 and 15 and the handrail material fixed pipes 1 and 11 are provided.



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### LEGAL STATUS

[Date of request for examination]

21.08.2001

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[Date of final disposal for application]

[Patent number] 3501419

[Date of registration] 12.12.2003

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

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[Claim(s)]

[Claim 1] The semi-sphere of a hollow-like pair where it doubled, opening formed the solid sphere mutually, and the catching hole was formed in the side face, A guide side rotatable in same axle after doubling this semi-sphere mutually, forming the solid sphere and said semi-sphere's having met mutually, The handrail material fixed cylinder of a pair with [ have the almost same spherical-surface-like crevice as a part of spherical surface of said semi-sphere in an end face, and ] a catching hole to this spherical-surface-like crevice, Have the handrail material fixed to this handrail material fixed cylinder, and the catching hole established in the spherical-surface-like crevice of said handrail material fixed cylinder and the catching hole formed in said semi-sphere are made to meet respectively. Each catching hole is made to penetrate a connection member with the part of a movable size for the inside of each catching hole. By preparing the engagement member which makes the both ends of this connection member engage with said semi-sphere and a handrail material fixed cylinder respectively, doubling said semi-sphere mutually, and forming a solid sphere, along said guide side, while each semi-sphere is rockable with said handrail material fixed cylinder The handrail prepared rockable in the field where said connection member includes said guide side with said handrail material fixed cylinder in said each catching hole, and the field which intersects perpendicularly mostly.

[Claim 2] It is the handrail of claim 1 whose width of face of the shorter side the catching hole established in said semi-sphere is formed in the direction in which the piece of insertion of said connection member intersects perpendicularly to the guide side of said semi-sphere in the shape of a rectangle for a long time, and is an equal mostly with the width of face of said piece of insertion.

[Claim 3] Said connection member is a handrail according to claim 1 or 2 which has the stop section engaged in said handrail material fixed cylinder, and has the step to which the engagement member which stops this piece of insertion in said semi-sphere engages with the piece of insertion of said connection member.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is a handrail prepared in a stairway etc., and relates to the handrail used especially for a refraction part.

[0002]

[Description of the Prior Art] Since it was necessary to also attach a handrail along the stairway in case a handrail is attached in the side face of the stairway in the case of the configuration where the former, for example, a stairway, bent on the way, as the handrail of the shape of two or more straight line was made to become independent, respectively, and was attached or it was shown in drawing 16, the straight-line-like handrail material 25 had been attached in the both sides through the middle connection member 23 doubled with the angle of bend of a stairway.

[0003]

[Problem(s) to be Solved by the Invention] It was what in the case of the former of said Prior art fixed parts increase in number, the number of components of a handrail also increases, and the number of fitters increases. Moreover, since the connection include angle of the handrail material 25 changed according to the include angle of the stairway etc. in order to connect the two handrail material 25 to the both sides using the middle connection member 23 in the case of the latter of said Prior art, as shown in drawing 16, it had to attach for every stairway of the and the pars intermedia material 23 according to an include angle had to be prepared. therefore, the manufacture cost of a handrail -- starting -- components mark -- increasing -- attachment cost -- high -- also becoming -- it comes out -- it was.

[0004] This invention was made in view of the trouble of said Prior art, and aims at offering simply the handrail which can adjust an angle of bend in an installation site to any crookedness conditions.

[0005]

[Means for Solving the Problem] The semi-sphere of a hollow-like pair where this invention was doubled in opening, and formed the solid sphere mutually, and the catching hole was formed in the side face, A guide side rotatable in same axle after doubling this semi-sphere mutually, forming the solid sphere and said semi-sphere's having met mutually, The handrail material fixed cylinder of a pair with [ have the almost same spherical-surface-like crevice as a part of spherical surface of said semi-sphere in an end face, and ] a catching hole to this spherical-surface-like crevice, Have the handrail material fixed to this handrail material fixed cylinder, and the catching hole established in the spherical-surface-like crevice of said handrail material fixed cylinder and the catching hole formed in said semi-sphere are made to meet respectively. Each catching hole is made to penetrate a connection member with the part of a movable size for the inside of each catching hole. By preparing the engagement member which makes the both ends of this connection member engage with said semi-sphere and a handrail material fixed cylinder respectively, doubling said semi-sphere mutually, and forming a solid sphere, along said guide side, while each semi-sphere is rockable with said handrail material fixed cylinder Said connection member is the handrail prepared rockable in the field which includes said guide side with said handrail material fixed cylinder, and the field which intersects perpendicularly mostly in said each

catching hole.

[0006]

[Function] To the semi-sphere in which the handrail material fixed cylinder of said pair was attached respectively, the handrail of this invention is prepared rockable relatively, and while said spherical section had maintained the solid sphere further in this rotation direction and the direction which intersects perpendicularly, each semi-sphere can rotate it with a handrail material fixed cylinder.

[0007]

[Example] Hereafter, one example of this invention is explained based on a drawing. The guide sides 5c and 15c which carry out rotation sliding in same axle mutually after the handrail of this example has the semi-spheres 5 and 15 of a hollow-like pair and has doubled them with the opening periphery section of these semi-spheres 5 and 15 mutually, as shown in drawing 1 are formed. Furthermore, the handrail material fixed cylinders 1 and 11 of a pair with the almost same spherical-surface-like crevices 1a and 11a as a part of spherical surface of semi-spheres 5 and 15 are formed in an end face, the handrail material 17 is respectively fixed to the \*\*\*\*\* material fixed cylinders 1 and 11, and a handrail is formed.

[0008] Guide side 15c of semi-spheres 5 and 15 has the configuration which the inner skin perimeter cut in the shape of a right angle, and lacked, and guide side 5c consists of the protruding edge section which engages with this guide side 15c. Furthermore, as shown in drawing 1 , drawing 4 , and drawing 5 , the catching holes 5a and 15a of the shape of a rectangle respectively extended [ guide side 5c and near the 15c ] from the side are formed in semi-spheres 5 and 15.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the partial fracture front view of the handrail of one example of this invention.

[Drawing 2] They are the top view (A) showing the handrail material fixed cylinder of this example, a front view (B), a right side view (C), and a left side view (D).

[Drawing 3] They are the top view (A) showing other handrail material fixed cylinders of this example, a front view (B), a right side view (C), and a left side view (D).

[Drawing 4] They are the top view (A) showing the semi-sphere of the component part of this example, a partial fracture front view (B), and a right side view (C).

[Drawing 5] They are the top view (A) showing other semi-spheres of the component part of this example, a front view (B), and a right side view (C).

[Drawing 6] They are the top view (A) showing the connection member of this example, a front view (B), and a right side view (C).

[Drawing 7] They are the top view (A) showing the engagement member of this example, a front view (B), and a right side view (C).

[Drawing 8] It is the assembly Fig. of the handrail material fixed cylinder of this example.

[Drawing 9] It is the assembly Fig. of the handrail material fixed cylinder of this example.

[Drawing 10] It is the assembly Fig. of the handrail material fixed cylinder of this example.

[Drawing 11] It is the assembly Fig. of the handrail material fixed cylinder of this example.

[Drawing 12] It is the assembly Fig. of other handrail material fixed cylinders of this example.

[Drawing 13] It is the perspective view which looked at the handrail of this example from the lower part.

[Drawing 14] It is the perspective view which looked at the handrail of this example from the upper part.

[Drawing 15] It is the perspective view showing the example of use of the handrail of this example.

[Drawing 16] It is the conventional handrail.

[Description of Notations]

1 11 Handrail material fixed cylinder

1a, 11a Spherical-surface-like crevice

1b, 11b Catching hole

3 Connection Member

5 15 Semi-sphere

5a, 15a Catching hole

7 Engagement Member

9 Semicircle Cylinder Part Material

17 Handrail Material

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[Translation done.]

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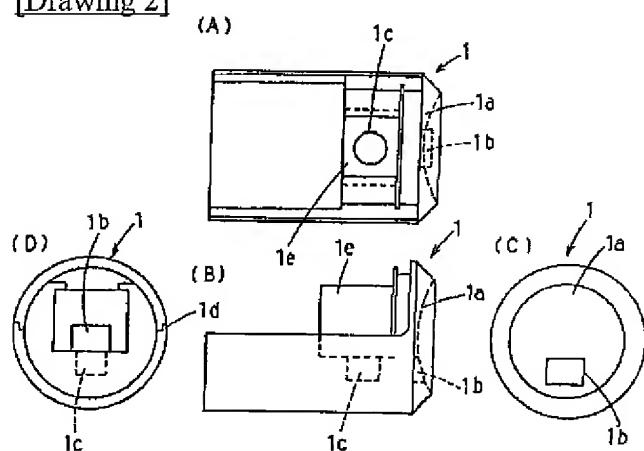
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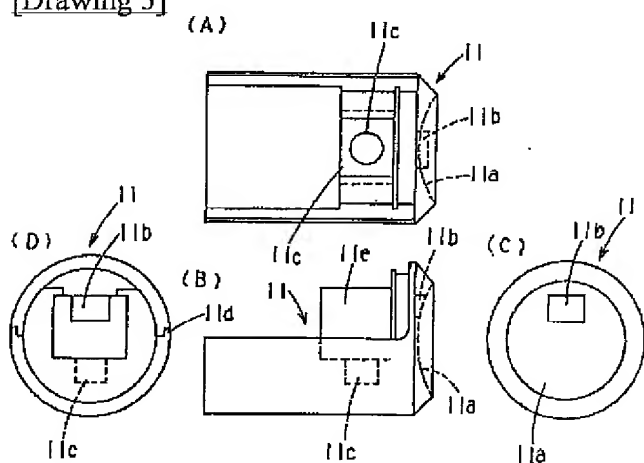
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## DRAWINGS

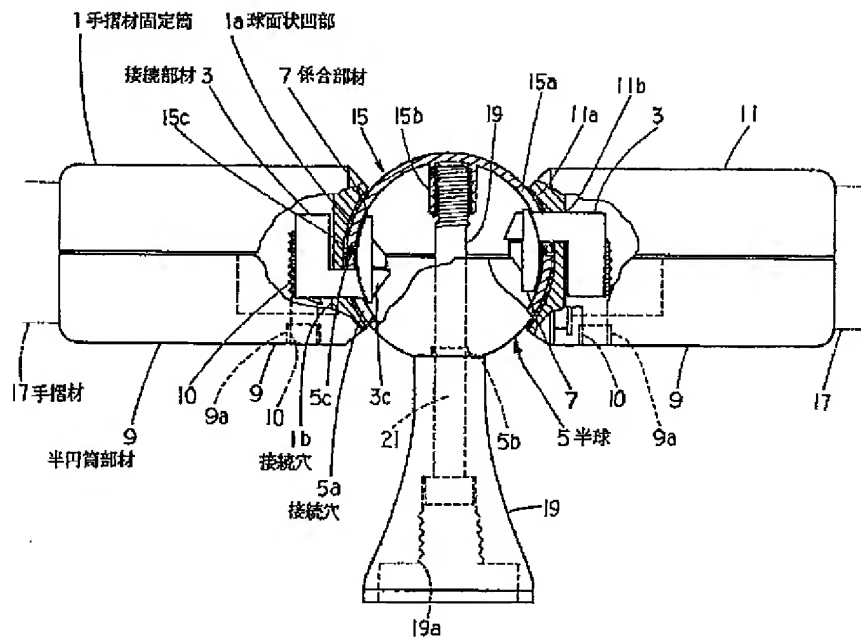
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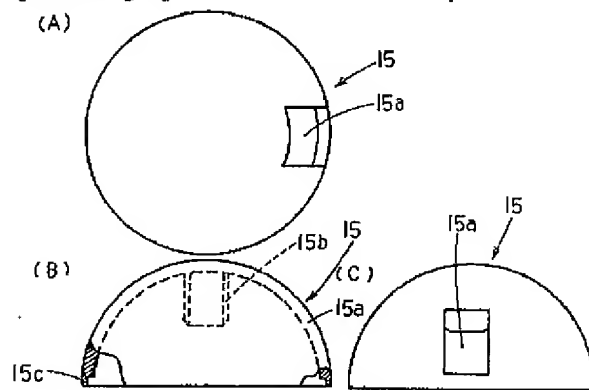
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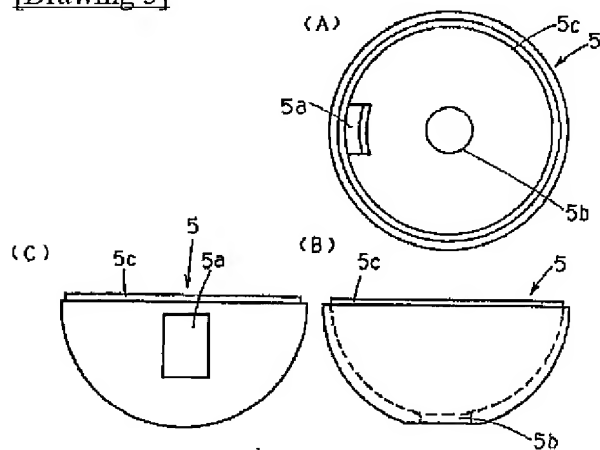
[Drawing 1]



[Drawing 4]

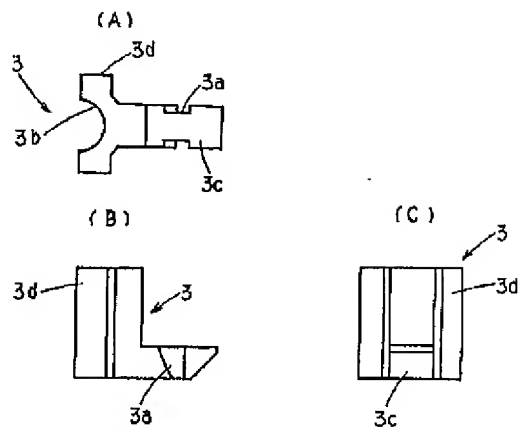


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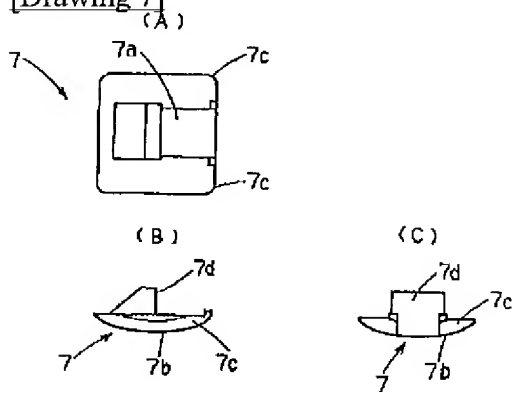


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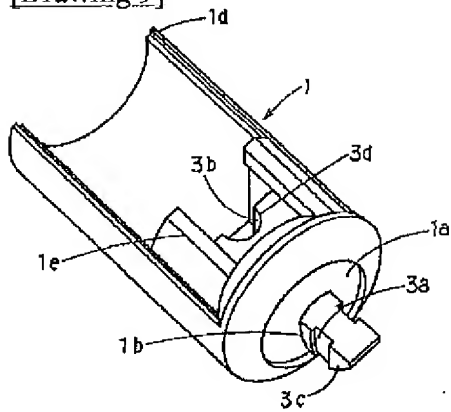




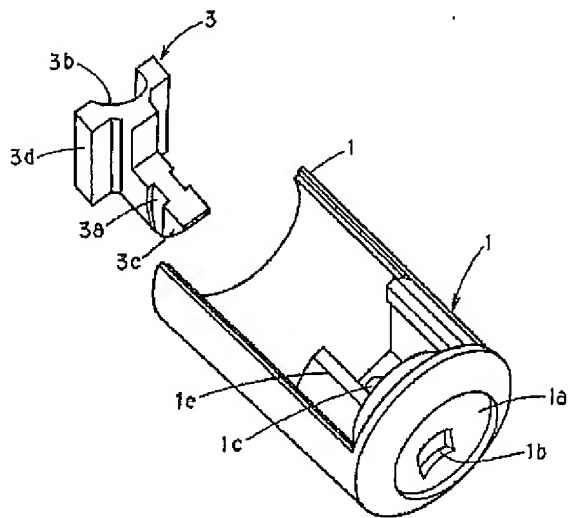
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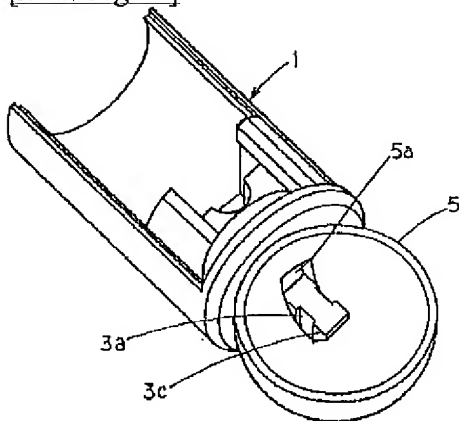
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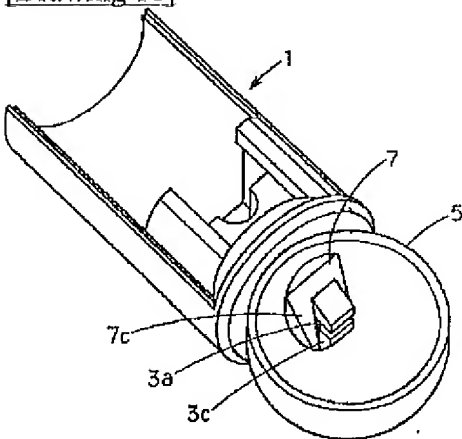
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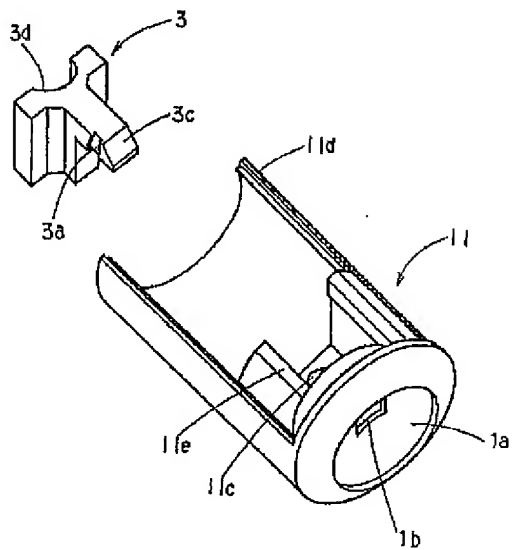
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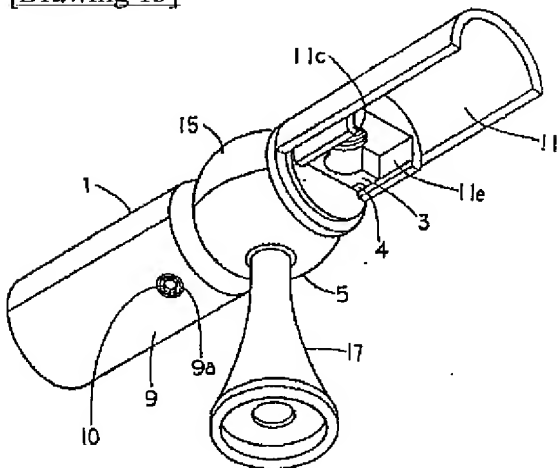
[Drawing 11]



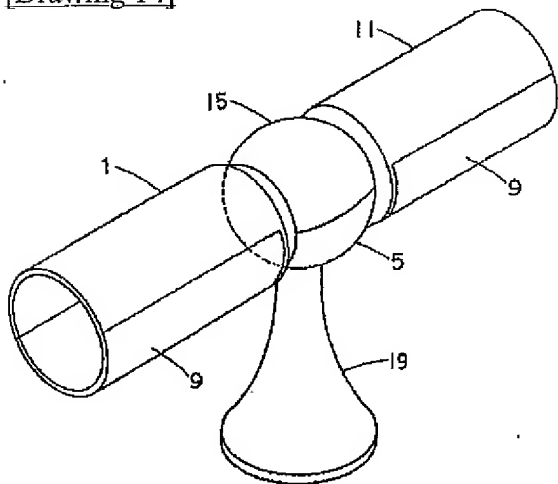
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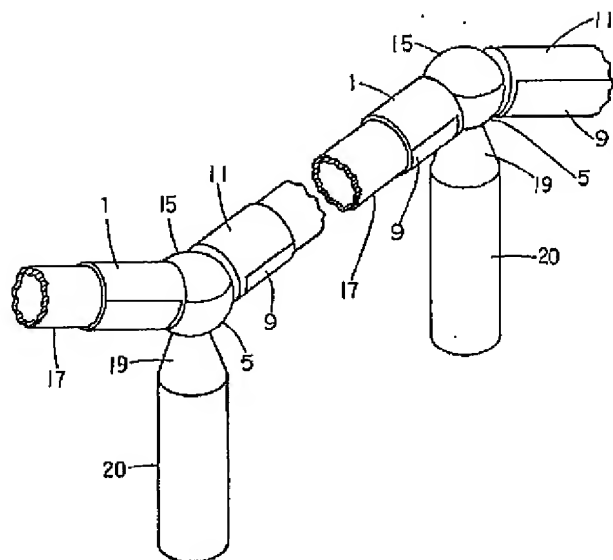
[Drawing 13]



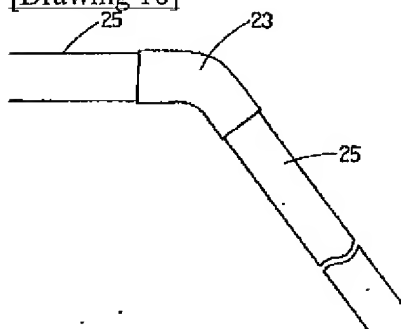
[Drawing 14]



[Drawing 15]



[Drawing 16]



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TECHNICAL FIELD

---

[Industrial Application] This invention is a handrail prepared in a stairway etc., and relates to the handrail used especially for a refraction part.

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PRIOR ART

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[Description of the Prior Art] Since it was necessary to also attach a handrail along the stairway in case a handrail is attached in the side face of the stairway in the case of the configuration where the former, for example, a stairway, bent on the way, as the handrail of the shape of two or more straight line was made to become independent, respectively, and was attached or it was shown in drawing 16, the straight-line-like handrail material 25 had been attached in the both sides through the middle connection member 23 doubled with the angle of bend of a stairway.

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EFFECT OF THE INVENTION

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[Effect of the Invention] Since include-angle change is possible for this handrail to shaft orientations, it can set the include angle of the connection part of a handrail as them appropriately easily also to the stairway of a complicated configuration in a construction site. Therefore, it is not necessary to prepare various middle material beforehand. Moreover, in every include angle, since the connection member is always covered with the ball, it is beautiful also for appearance, does not have what is caught in a user's hand, and can obtain a good feeling of use. moreover, that a process becomes simple, and a special tool and a special expert -- not needing -- simplification of a design, processing, and enforcement -- it can plan -- moreover, completeness -- since it is sectional, conveyance is also easy.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] It was what in the case of the former of said Prior art fixed parts increase in number, the number of components of a handrail also increases, and the number of fitters increases. Moreover, since the connection include angle of the handrail material 25 changed according to the include angle of the stairway etc. in order to connect the two handrail material 25 to the both sides using the middle connection member 23 in the case of the latter of said Prior art, as shown in drawing 16 , it had to attach for every stairway of the and the pars intermedia material 23 according to an include angle had to be prepared. therefore, the manufacture cost of a handrail -- starting -- components mark -- increasing -- attachment cost -- high -- also becoming -- it comes out -- it was. [0004] This invention was made in view of the trouble of said Prior art, and aims at offering simply the handrail which can adjust an angle of bend in an installation site to any crookedness conditions.

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MEANS

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[Means for Solving the Problem] The semi-sphere of a hollow-like pair where this invention was doubled in opening, and formed the solid sphere mutually, and the catching hole was formed in the side face, A guide side rotatable in same axle after doubling this semi-sphere mutually, forming the solid sphere and said semi-sphere's having met mutually, The handrail material fixed cylinder of a pair with [ have the almost same spherical-surface-like crevice as a part of spherical surface of said semi-sphere in an end face, and ] a catching hole to this spherical-surface-like crevice, Have the handrail material fixed to this handrail material fixed cylinder, and the catching hole established in the spherical-surface-like crevice of said handrail material fixed cylinder and the catching hole formed in said semi-sphere are made to meet respectively. Each catching hole is made to penetrate a connection member with the part of a movable size for the inside of each catching hole.

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OPERATION

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[Function] To the semi-sphere in which the handrail material fixed cylinder of said pair was attached respectively, the handrail of this invention is prepared rockable relatively, and while said spherical section had maintained the solid sphere further in this rotation direction and the direction which intersects perpendicularly, each semi-sphere can rotate it with a handrail material fixed cylinder.

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EXAMPLE

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[Example] Hereafter, one example of this invention is explained based on a drawing. The guide sides 5c and 15c which carry out rotation sliding in same axle mutually after the handrail of this example has the semi-spheres 5 and 15 of a hollow-like pair and has doubled them with the opening periphery section of these semi-spheres 5 and 15 mutually, as shown in drawing 1 are formed. Furthermore, the handrail material fixed cylinders 1 and 11 of a pair with the almost same spherical-surface-like crevices 1a and 11a as a part of spherical surface of semi-spheres 5 and 15 are formed in an end face, the handrail material 17 is respectively fixed to the \*\*\*\*\* material fixed cylinders 1 and 11, and a handrail is formed.

[0008] Guide side 15c of semi-spheres 5 and 15 has the configuration which the inner skin perimeter cut in the shape of a right angle, and lacked, and guide side 5c consists of the protruding edge section which engages with this guide side 15c. Furthermore, as shown in drawing 1, drawing 4, and drawing 5, the catching holes 5a and 15a of the shape of a rectangle respectively extended [ guide side 5c and near the 15c ] from the side are formed in semi-spheres 5 and 15. Moreover, female screw hole 15b is formed in the inner skin crowning of a semi-sphere 15, and bore 5b is formed in the crowning of a semi-sphere 5.

[0009] As the handrail material fixed cylinders 1 and 11 are shown in drawing 2 and drawing 3, the attachment crevices 1e and 11e of the connection member 3 mentioned later are formed inside [ from which a part for a side-face semicircle was excised ] the spherical-surface-like crevices 1a and 11a which are configurations and are the end side. The female screw sections 1c and 11c are formed in the pars basilaris ossis occipitalis of these attachment crevices 1e and 11e.